Lalande for Venus and Mercury, showed with the observations very great errors which the theory of Laplace promised to eliminate, or at the very least to diminish. It was to the solution of these questions that Laplace directed the forces of the Bureau, and it was to their practical execution that he applied the resources which the budget granted him.

"To accelerate the work, the different parts were distributed to various members of the Bureau. The tables of the moon, on account of the constant use made of them in astronomy and navigation, were those which it was of special importance should be completed promptly; but the length of the researches, the magnitude of the calculations, which so complicated a theory required, only permitted the hope to be cherished that in the distant future errors might be made to disappear which had gone on increasing from day to day. This was the occasion of making an appeal to all astronomers, national and foreign, who might have sufficiently advanced works upon the lunar tables. With this object the Bureau des Longitudes was authorised to offer a prize."*

This prize of 8,000 francs was awarded by the Bureau to an astronomer of Vienna, Bürg, whose tables, based upon 2,500 observations, made at Greenwich from 1765 to 1795, were deemed the most accurate and convenient. At the same time, Delambre published new tables of the sun; Bouvard, pupil of Laplace, whom he had assisted in the publication of the *Mécanique céleste* (Laplace resigned to him entirely the detailed investigations and astronomical calculations), published *Nouvelles Tables des planètes Jupiter et Saturne* (1808), a new edition of which he brought out in 1824, to which were added tables of Herschel's planet, Uranus; Delambre published his *Tables écliptiques des satellites de Jupiter* (according to the theory of Laplace and the totality of the observations made from 1662 to 1802); Burckhardt, a German astronomer, whom the conquests of Napoleon had given to France, published new *Tables de la lune* (1812), which, in the estimation of some astronomers, took the place of those of Bürg.

However, the impulse given by the splendid works of Laplace was not confined within the French frontiers. In Italy, a celebrated astronomer, Francisco Carline, published, in 1810, new tables of the sun, which were soon employed everywhere except in France.† In Germany, a man of Science, who was at one and the same time an eminent lawyer, a distinguished captain, and an excellent astronomer, Bernhard von Lindenau, published, according to Laplace's theory, tables of Venus, Mars, and Mercury.‡

Unfortunately these excellent works, due to the powerful initiative of Laplace, were not made use of in the publication of the *Connaissance des Temps*.

In 1808, Delambre, one of the most eminent French astronomers, undertook the direction of the *Connaissance des Temps*. No essential change was made in the work till 1817; at that time the right ascension of the moon, which had until then been calculated only to a minute, was given to a second for noon and midnight. Sailors could thus determine the longitude of their ships with more exactness; and astronomers, instead of finding in the *Connaissance des Temps* only the indication of the time at which they ought to observe our satellite, could thus compare the results of their observations with those which the tables gave, and prepare the material for their improvement. Finally, in 1820, were introduced the differences in right ascension and in declination of the sun, differences useful in calculating the preceding co-ordinates at an hour other than that of noon. This was still another advantage to sailors.

But these improvements were of very little consequence in comparison with those which astronomy, geography, and navigation demanded. Germany was the first to set an example in this direction, and the Royal Astronomical Society of London, after a long and learned discussion, came to the conclusion that they were necessary. Moreover, besides being incomplete, the *Connaissance des Temps* was full of errors from beginning to end, errata being found even among the errata themselves. Radical reforms were indispensable; but to make this clearly evident, we must return to the history of the "Nautical Almanac" and the Berlin "Jahrbuch."

(*To be continued.*)

MAN IN THE SETTLE CAVE

UNTIL the appearance of Mr. Tiddeman's paper in NATURE, vol. ix. p. 14, I had not fully realised the important issues which, according to him, depend upon the proper identification of the fragment of bone from the Victoria Cave to which he refers; nor was I aware that he was about to commit me in such very absolute terms to the opinion that it was human, but of this, as it turns out, I have no reason to complain.

Looking, however, at the apparent gravity of the statement, and knowing, also, that opinions might, and as I believe did, differ as to the origin of the bone, I have been induced to go into the matter again, and am now in a position to affirm that there is no room for the slightest doubt on the subject.

Mr. James Flower, the excellent and estimable articulator to the College of Surgeons, to whom I am under many obligations for assistance in such questions, and who at one time suggested, and had almost convinced me, that the bone was elephantine, has, after much search, found amongst the Museum stores of human osteology, a *fibula* which places the question beyond all doubt, and fully confirms the opinion I had come to, especially after seeing the Mentone skeleton, that the Victoria relic, pre- or post-glacial as it may be, is human. It is further important as showing that bones of the same conformation may occasionally be met with at the present day.

GEO. BUSK

Harley Street, Nov. 14

NOTES

DR. A. DEW-SMITH and Francis M. Balfour of Trinity College, Cambridge, have been nominated by the Board of Natural Science Studies, in accordance with the grace of the Senate (May 1, 1873), to study at the Zoological Station at Naples under Dr. Dohrn, until the end of July 1874.

AT the General Monthly Meeting of the Royal Institution to be held on Monday first, a President will be elected in the room of the late Sir Henry Holland, Bart.

PROFESSOR TRAQUAIR, of the Royal College of Science in Dublin, has been appointed to the Keepership of the Natural History Museum in the Edinburgh Museum of Science and Art. This gentleman was formerly one of the Demonstrators to the Professor of Biology in the University of Edinburgh, and is the author of several important contributions to Science.

MR. W. F. BARRETT, F.C.S., has been appointed Professor of Physics to the Royal College of Science, Dublin, in succession to the late Professor W. Barker. We feel sure that this appointment will give great satisfaction. Sir Robert Kane, F.R.S., having resigned the post of Dean of Faculty to the College, for the purpose of spending his winters in the south of Europe, Professor Galloway has been selected to fill this post. It is said that there either are, or will very shortly be, a vacancy in the Professorship of Chemistry owing to Professor Sullivan's appointment to the Presidentship of the Queen's College, Cork.

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* Report of the Bureau des Longitudes, 1800.

† "Esposizione di un nuovo methodo di construire le Tavole Astromische applicato alle Tavole del Sole" (Milan, 1810).

‡ "Tabulæ Veneris novæ et correctæ ex theoria gravitatis, *clarissimi de Laplace*, et ex observationibus recentissimis in specula astronomica Seebergensi habitis erectæ" (Gotha, 1810). "Tabulæ Martis novæ et correctæ ex theoria gravitatis, *clarissimi de Laplace*, et ex observationibus recentissimis erectæ" (Essenberg, 1811). "Investigatio nova orbitæ a mercurio circa soli descriptæ, accedunt Tabulæ Planetæ ex Elementis recens repertis et theoria gravitatis, *illustrissimi de Laplace* constructæ" (Gotha, 1813).

DR. E. H. BENNETT has been elected Professor of Surgery in the University of Dublin, in succession to the late Dr. R. W. Smith; and Dr. Thos. E. Little has been elected to fill the post of University Anatomist. In connection with news from the Dublin University, we may mention that it is understood that the authorities have determined to build a new museum for their anatomical and zoological collections. At present, in connection with the Medical School, there is a small collection of human and comparative anatomy, and, in the Arts' School a very good collection of zoology. It is intended to combine these two in a new building. The College authorities would confer a great boon on natural science in Dublin if they would venture to go a step further and make their new museum contain all their biological collections. The advantages would be great of having the distribution of animals in space and time shown in connection the one with the other; and there is something incongruous in separating the specimens illustrating the past and present races of mankind from the zoological collection, and combining the specimens illustrating the anatomy and physiology of the human species with those illustrative of the other animals. For the convenience of the students, we trust that the extensive herbarium of the College may also be lodged under the roof of the new building, which, to be useful, need contain no lofty halls or grand corridors, but should consist of a series of well-lit rooms, after the fashion of, we would suggest, that nicest of museums, the one for Economic Botany at Kew.

THE following memorandum on the Whitworth Scholarships, prepared by Sir Joseph Whitworth, has been approved by the Lords of the Committee of the Council on Education:—"I wish that candidates for my Scholarships in 1874, who, owing to the shortness of the notice, may not have been able to be in a mechanical shop for six months before the competition takes place, should be allowed to compete, but that if successful, their scholarship should not begin until they have worked six months in a mechanical shop. I think the same privilege should be accorded to candidates in 1875, who have not served eighteen months in a mechanical shop, the scholarship not beginning until this period is completed."

THE 120th session of the Society of Arts was opened on the 19th inst. with an address by the Chairman of the Council, Major-General F. Eardley-Wilmot, F.R.S.

THE *magnum opus* of three generations of botanists, De Candolle's "Prodromus Systematis naturalis vegetabilium," containing a diagnosis of every known species of flowering plant, has now been completed as far as Dicotyledons are concerned, and it is not intended to continue the work into the Monocotyledons. In commemoration of the completion of the work, the Horticultural Society of Belgium has awarded M. de Candolle a special medal. The publication of the work was commenced in 1818.

THE trustees of the Gilchrist Educational Fund offer a scholarship of the value of 50*l.* per annum, tenable for three years at Girton College, Cambridge, to be competed for at the General Examination for Women, conducted by the University of London in May, 1874.

FROM the commencement of next year, *The Gardeners' Chronicle and Agricultural Gazette* will be divided into two papers, each weekly, to be devoted to the interests of the two sister sciences.

DR. WILLIAM WALLACE, in opening recently the session of the Chemical Section of the Philosophical Society of Glasgow, spoke, among other things, of the endowment of research. From what he said on this subject, we think the following pointed remarks worthy of attention:—With regard to students who attended evening lectures and classes, a very great deal had been done for them by the Society of Arts, and by the examiners of the Science and Art Department, both of which had given great encouragement to the class of students whom they were intended to benefit. What was lacked most was a stimulus to men of the highest educational class. In this country, apart from professorships, there were no means of assisting that class except, perhaps, a few sinecures and the conferring of empty titles. In France, at least under the Imperial *régime*, when a man acquired renown in a particular line of investigation, a laboratory with all the best and most suitable appliances was immediately fitted up for him. Hence Paris was provided with a series of the most complete laboratories for metallurgy, for agriculture, for the sugar manufacture, and for many other branches of the science; and students might go to study a particular subject with the certainty that they would have a most efficient teacher and the advantages of a laboratory fitted up specially, and, as one might say, regardless of expense, with the apparatus and requirements necessary for the teaching and study of the subject. It appeared to him (Dr. Wallace) that the endowment of research would form a desirable stimulus for chemists, many of whom had the necessary education and talent, but could not afford the time nor the expense, often considerable, of obtaining the apparatus and materials required.

A SOCIETY of Physical and Natural Science was founded four years ago at Caracas, Venezuela; but the political agitations of the country have, until recently, hindered its development. Meanwhile it has commenced the publication of a Bulletin under the title of *Vargasia*, so named in honour of the American botanist Vargas. *L'Institut* learns, by a letter from Dr. Ernst, who is at once president, secretary, and treasurer of the society, that the present Government of Venezuela intends to promote, as much as it can, the growth of scientific studies, mainly by the establishment of various institutions for public instruction. Dr. Ernst, appointed Professor of Botany in the University of Caracas, where hitherto there has been no such chair, has been charged with the direction or rather the creation of a botanic garden and a museum of natural history. In the museum Prof. Ernst intends to collect—1st, a herbarium of Venezuela; 2nd, a general herbarium; 3rd, a collection relating to economic botany. He intends to publish in a few years a Flora of Caracas. Dr. Ernst appeals to European botanists and collectors for exchanges to assist him in the formation of these herbaria.

IT is not often that Mr. Disraeli says anything which calls for particular notice in a journal of this kind, therefore it is with peculiar pleasure that we quote the opinion he uttered last week at the Glasgow banquet as to the share which Science has had during the present century in moulding the world. Coming from a man of his shrewdness and sentimentality withal, the words have a striking force. Speaking of the last fifty years, he said:—"How much has happened in these fifty years—a period more remarkable than any, I will venture to say, in the annals of mankind. I am not thinking of the rise and fall of empires, the change of dynasties, the establishment of Governments. I am thinking of those revolutions of science which have had much more effect than any political causes, which have changed the position and prospects of mankind more than all the conquests and all the codes and all the legislators that ever lived."

AT the first meeting of the Edinburgh Botanical Society for the winter, Mr. James McNab, curator of the Royal Botanical Gardens, delivered an address on the change of climate in Scotland, which, during the last fifty years has undergone a considerable lessening of the summer heat. From this cause peaches and nectarines cannot be ripened to the same perfection in the open air as formerly, while asparagus, mushrooms, and tomatoes are gradually disappearing. The larch, in spite of the enormous quantities of seed annually imported, if declining in vigour, and there is a talk of substituting for is the Wellingtonia as a nurse-tree. Mr. McNab proposes that a central committee should be appointed to investigate the whole subject of the change of climate in Scotland.

THE following is an ephemeris (for 0^h Berlin time) of the comet discovered by M. Coggia at Marseilles, on the evening of the 10th inst:—November 22, $14^h\ 51^m\ 25^s$—$6^\circ\ 8'\cdot2$; November 30, $14^h\ 14^m\ 30^s$—$22^\circ\ 43'\cdot0$; December 8, $14^h\ 0^m\ 17^s$ $-32^\circ\ 1'.8$. Its elements are:—T = Dec., 4·1348, Berlin mean time; $\pi = 94^\circ\ 23'\ 14''$; $\Omega = 254^\circ\ 14'\ 9''$; $i = 27^\circ\ 2'\ 7''$. Mean Equinox, 1873·0 *log. q.* = 9·83810.

ONE of the special results of the United States geological and geographical survey of the Territories, in charge of Prof. F. V. Hayden, during the past summer, has been the discovery that Colorado Territory is the centre of the greatest elevation of the Rocky Mountain chain. In Central Colorado the chain proper is about 120 miles broad, made up of three lofty parallel ranges, running nearly north-north-west, and flanked from the west by great plateaus and groups of peaks. Between the ranges lie the great elevated basins known as "parks." The front range, which rises abruptly from the plains, is seen from Denver in a grand panorama 120 miles long. From its snowy serrated crest rise many peaks between 13,000 and 14,000 ft. high. On the west side of the parks is the Park Range, whose highest group is at Mount Lincoln, this and Quandary Peak each rising to about 14,000 ft. The survey has established a permanent meteorological station at Fairplay, 10,000 ft. above the sea, and another at Cañon City, about 6,000 ft. These stations are all connected by a spirit-level line, and the comparison of their observations will be of remarkable interest. The National Range lies east of the Park Range, and is separated from it by the Arkansas Valley. West of the National Range rises the great group of Elk Mountains, five of whose peaks are 14,000 ft. high. So far as known, there are in the district explored during the past season by the survey 72 peaks, ranging from 14,000 to 14,200 ft. in height.

IN the article on Local Societies (vol. ix. p. 24) we inadvertently confounded the Manchester Natural History Society with the Microscopical and Natural History section of the Manchester Literary and Philosophical Society. The former of these is extinct—having handed its collections over to the Owens College—and also contributed a handsome sum of money to promote, permanently, the study of Natural History in the Literary and Philosophical Society. This endowment now enriches the Natural History section of that society. Manchester science will gain rather than lose by these changes. The defunct society was never more than the creator and guardian of a museum. That museum will still be preserved and increased, as well as utilised, by the College, whilst the Natural History section affords promise of a healthy career of scientific work.

M. CHARREL, of Marseilles, writes as follows to the *Bulletin International*, of the Observatory of Paris, on the invention of balloons:—In the literary history of the City of Lyons, published by Father Colonnia (1830, vol. i. p. 112), it is stated that in the reign of Louis le Debonnaire, the Archbishop of Lyons learned that some aërial navigators had fallen with their boat on the banks of the Saone, and were going to be put to death as sorcerers. He ordered them to be brought into his presence, and after having heard them, he caused them to be nonsuited (*le fit mettre hors de procès*). The memoir of the prelate bears such a character of authenticity as leaves no doubt of the fact. The following words are taken verbatim from the memoir: "Videmus exhibere vinctos quatuor *homines;* tres viros et unam feminam, quasi qui de ipsis navibus ceciderunt, quos . . . exhibuerunt in nostra presentia tanquam lapidandos." It follows, then, from this memoir, that already, in the ninth century, aërial navigation was known; how it was accomplished the memoir does not give any indication.

THE first Annual Exhibition of the West London Entomological Society, established 1868, will be held on December 2 and 3, at the "Mason's Arms," Tichborne Street, Edgware Road.

A *Times* telegram from Teheran, November 24, says that Colonel Baker and Lieutenant Gill have arrived at Teheran, and leave immediately for England, *viâ* Tabreez and Erivan. Travelling to the north from Meshed, they passed along the Turcoman frontier by Kelat, Abiverd, Dereguez, Annau, Astrabad, and Nissa. Striking south, they discovered the source of the Attrek at Karakazan, an extraordinary spring near Shirvan, and followed the course of the river to a considerable distance north-west of Bojnoord, until stopped by hostilities between Bojnoord and the Turcomans. Striking into the mountains, they were enabled to trace the course of the river until it fell into the plains, and also to observe the great range of mountains which runs along the whole Persian frontier from Sarakhs to Kizil Arvat. Existing conjectural maps of this country are quite incorrect.

ON the 1st inst. the Earl of Dalhousie formally opened the Art Exhibition and Museum of the Albert Institute of Dundee, which, with the previously opened portions—free library and lecture-hall—form one handsome block of buildings. In the list of towns, with their scientific societies, published by us a week or two ago, we were surprised to see Dundee, so rapidly advancing in population and wealth, occupy so humble a place. We cannot see how towns like Leeds, Newcastle, Manchester, Glasgow, and others should have their flourishing and well-equipped scientific societies, while Dundee has only one small struggling society of young men, the Naturalists' Field Club. The neighbouring and comparatively stagnant town of Perth, with its large and efficient society, puts Dundee to the blush in this respect. We shall be disappointed if the opening of the Albert Institute in Dundee, a town so dependent for its commercial and manufacturing success on the applied results of Science, does not give an impetus to the study of Science. There are already Science and Art Classes in the town, and we hope to hear soon of the establishment of regular courses of scientific lectures, such as those which are found in several of the large English manufacturing towns, and the formation of at least one flourishing scientific society and field club around the small nucleus already existing. We hope also that the collections in the museum will be made worthy of the wealthy town and be really representative of the treasures of the various kingdoms of Nature. We feel sure that the citizens of Dundee only need their attention to be drawn to the backward state of their town in the matter referred to to rouse them to put it on a level in this respect with the large English towns.

THE additions to the Zoological Society's collection during the last week include an Eagle (*Spizaëtus ?*) from Burmah, presented by Mr. H. Fielder; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. Gore; a pair of Jaguars (*Felis onça*) born in the Jardin des Plantes, Paris, received in exchange.